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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/677,578	10/03/2000	Toshinori Nagahashi	105738	5671

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EXAMINER

LIANG, LEONARD S

ART UNIT PAPER NUMBER

2853

DATE MAILED: 09/11/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/677,578

Applicant(s)

NAGAHASHI, TOSHINORI

Examiner

Leonard S Liang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 October 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Priority

Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Japan on 10/04/1999. It is noted, however, that applicant has not filed a certified copy of the 11-283247 application as required by 35 U.S.C. 119(b).

Drawings

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: L15. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 1-10 are rejected under 35 U.S.C. 102(e) as being anticipated by Kakutani (US Pat 6158841).

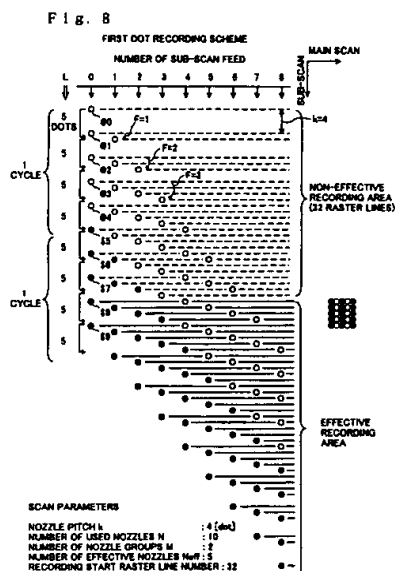
Kakutani discloses:

- {claim 1} A method for controlling a printer (column 2, lines 16-17), the method comprising the steps of: examining the relationship of a position in each printing

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pass, of each of a plurality of the pins provided in the vertical direction of the printing head to a plurality of raster lines to be printed in a predetermined printing range (figure 8; column 2, lines 45-52),

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based on the vertical resolution of the print data (column 16, lines 45-51; Kakutani discloses the effect of resolution on print quality), the pitch of the pins of the printing head (column 1, lines 20-27), the amount of a unit of vertical transfer of the printing head (i.e. sub-scanning pitch; column 1, lines 20-27), the position of a print-starting raster line (figure 8, reference 'recording start raster line number'; column 12, lines 43-50), and the number of passes in the horizontal direction required for printing the predetermined range (column 1, lines 20-27); preparing a raster-line/pin-relationship table (figure 10; column 15, lines 11-22); determining a number of printing passes and a position of the print-starting raster line (figure 8, reference 'recording start raster line number'; column 1, lines 20-27); consulting the raster-line/pin-relationship table (figure 10; column 15, lines 11-22);

Fig. 10

NOZZLE NUMBERS FOR RECORDING RESPECTIVE RASTER LINES
 (FIRST DOT RECORDING SCHEME)

RASTER No.	No. of SUBSCAN		ADJOIN. even/odd	NUMBER OF SUB-SCAN FEED												
	even	odd		0	1	2	3	4	5	6	7	8	9	10	11	12
0	4(-)	0(-)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1	5()	1()	T	T	-	-	-	-	-	-	-	-	-	-	-	-
2	6()	2()	T	T	-	-	-	-	-	-	-	-	-	-	-	-
3	7()	3()	X	X	-	-	-	-	-	-	-	-	-	-	-	-
4	4(-)	0(-)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	5()	1()	T	T	-	-	-	-	-	-	-	-	-	-	-	-
6	6()	2()	T	T	-	-	-	-	-	-	-	-	-	-	-	-
7	7()	3()	T	T	-	-	-	-	-	-	-	-	-	-	-	-
8	8()	4()	X	X	-	-	-	-	-	-	-	-	-	-	-	-
9	5(-)	1(-)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	6()	2()	T	T	-	-	-	-	-	-	-	-	-	-	-	-
11	7()	3()	T	T	-	-	-	-	-	-	-	-	-	-	-	-
12	8()	4()	T	T	-	-	-	-	-	-	-	-	-	-	-	-
13	9()	5()	X	X	-	-	-	-	-	-	-	-	-	-	-	-
14	6(-)	2(-)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	7()	3()	T	T	-	-	-	-	-	-	-	-	-	-	-	-
16	8()	4()	T	T	-	-	-	-	-	-	-	-	-	-	-	-
17	9()	5()	T	T	-	-	-	-	-	-	-	-	-	-	-	-
18	10()	6()	X	X	-	-	-	-	-	-	-	-	-	-	-	-
19	7(-)	3(-)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20	8()	4()	T	T	-	-	-	-	-	-	-	-	-	-	-	-
21	9()	5()	T	T	-	-	-	-	-	-	-	-	-	-	-	-
22	10()	6()	T	T	-	-	-	-	-	-	-	-	-	-	-	-
23	11()	7()	X	X	-	-	-	-	-	-	-	-	-	-	-	-
24	8(-)	4(-)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25	9()	5()	T	T	-	-	-	-	-	-	-	-	-	-	-	-
26	10()	6()	T	T	-	-	-	-	-	-	-	-	-	-	-	-
27	11()	7()	T	T	-	-	-	-	-	-	-	-	-	-	-	-
28	12()	8()	X	X	-	-	-	-	-	-	-	-	-	-	-	-

0 : NOZZLES TO RECORD EVEN PIXELS
 \$: NOZZLES TO RECORD ODD PIXELS

printing the predetermined printing range by actuating the pins in each printing pass based on the raster-line/pin-relationship table (this is inherent to the invention).

- {claim 6} A print-controlling device for a printer (column 2, lines 16-17), the device comprising: a raster-line/pin-relationship table (figure 10; column 15, lines 11-22) describing pins to be actuated in each printing pass for printing raster lines to be printed based on the relationship between the position of the pins and the raster lines, by examining a relationship of a position, in each printing pass, of each of a plurality of the pins provided in a vertical direction of the printing head to a plurality of the raster lines to be printed in a predetermined printing range (figure 8; column 2, lines 45-52), based on the vertical resolution of the print data (column 16, lines 45-51; Kakutani discloses the effect of resolution on print quality), the pitch of the pins of the printing head (column 1, lines 20-27), an amount of a unit of vertical transfer of the printing head (i.e. sub-scanning pitch; column 1, lines 20-27), a position of a print-starting raster line (figure 8, reference 'recording start raster line number'; column 12, lines 43-50), and a number of passes in a horizontal direction required for printing the predetermined printing range (column 1, lines 20-27); a print data forming unit that forms print data to be printed (figure 1); a printer driver that determines the position of a print-starting

raster line and the number of printing passes (figure 8, reference 'recording start raster line number'; column 1, lines 20-27; driver is inherent to invention), consults the raster-line/pin-relationship table (figure 10; column 15, lines 11-22), and outputs a pin driving signal for each driving pass according to the raster-line/pin-relationship table (figure 1; pin driving signal is inherent to the invention); a printing head transferring unit that transfers the printing head to a predetermined position based on the signal from the printer driver (figure 2, references 31, 38); a data transmitting unit that transmits print data and information required for printing operation received from the printer driver (figure 1, reference 22)

- {claims 2 and 7} a plurality of the raster-line/pin-relationship tables being prepared according to the position of the print-starting raster line is inherent to the invention (since Kakutani discloses a print-starting raster line and a raster-line/pin-relationship table; it is inherent to the invention that there are different print-starting raster lines, and hence, different raster-line/pin-relationship tables).
- {claims 3 and 8} the position of the print-starting raster line being determined based on the print data under a condition of the vertical resolution of the print data, the pitch of the pins of the printing head, and the unit of vertical transfer of the printing head is inherent to the invention (Kakutani teaches that the printing scheme is defined by the vertical resolution of the print data, the pitch of the pins of the printing head, and the unit of vertical transfer of the printing head {as taught in claim 1 above}; it is inherent to the invention that this printing scheme is dependent on the position of the print-starting raster line).
- {claims 4 and 9} It is inherent to the invention that any one of the pluralities of raster-line/pin-relationship tables is selected according to the position of the print-starting raster line, which was determined. This is in view of the understanding that there is a plurality of raster-line/pin-relationship tables being prepared according to the position of the print-starting raster line.

- {claims 5 and 10} the pins used in each printing pass being actuated by consulting the selected raster-line/pin-relationship table is inherent to the invention (since Kakutani discloses printing by actuating the pins in each printing pass based on the raster-line/pin-relationship table {as taught in claim 1 above}).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

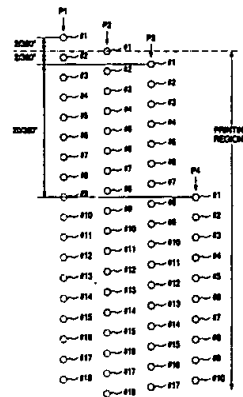
(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito et al (US Pat 5874970) in view of Erickson (US Pat 5592202).

Saito et al discloses:

- {claim 1} method for controlling a printer (column 3, lines 25-46), the method comprising the steps of: examining the relationship of a position, in each printing pass, of each of a plurality of the pins provided in the vertical direction of the printing head to a plurality of raster lines to be printed in a predetermined printing range (figure 1, column 1, lines 5-9; column 3, lines 25-46; column 5, lines 8-12),

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FIG. 1

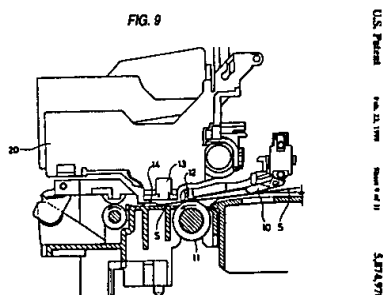


based on the vertical resolution of the print data (column 15, lines 15-16), the pitch of the pins of the printing head (column 3, lines 10-11; column 5, lines 23-25), the amount of a unit of vertical transfer of the printing head (column 3, line 9; secondary scanning control inherently controls unit of vertical transfer), the position of a print-starting raster line (figure 9, references 10-14; column 4, lines 27-45; paper positioning system described by references 10-14 inherently determine the print-starting raster line), and the number of passes in the horizontal direction required for printing the predetermined printing range (figure 11, references 11, 12, 14; column 4, lines 62-65; since leading and trailing edges of sheet are both detected, examining the relationship of a position based on the number of passes in the horizontal direction is inherent to the invention); determining a number of printing passes and a position of the print-starting raster line (figure 9, references 10-14; column 4, lines 27-45; paper positioning system described by references 10-14 inherently determine the print-starting raster line; figure 11, references 11, 12, 14; column 4, lines 62-65; since leading and trailing edges of sheet are both detected, examining the relationship of a position based on the number of passes in the horizontal direction is inherent to the invention).

- {claim 6} A print-controlling device for a printer (column 3, lines 25-46), the device comprising: examining the relationship of a position, in each printing pass, of each of a plurality of the pins provided in a vertical direction of the

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printing head to a plurality of raster lines to be printed in a predetermined printing range (figure 1, column 1, lines 5-9; column 3, lines 25-46; column 5, lines 8-12), based on the vertical resolution of the print data (column 15, lines 15-16), the pitch of the pins of the printing head (column 3, lines 10-11; column 5, lines 23-25), an amount of a unit of vertical transfer of the printing head (column 3, line 9; secondary scanning control inherently controls unit of vertical transfer), a position of a print-starting raster line (figure 9, references 10-14; column 4, lines 27-45; paper positioning system described by references 10-14 inherently determine the print-starting raster line), and a number of passes in a horizontal direction required for printing the predetermined printing range (figure 11, references 11, 12, 14; column 4, lines 62-65; since leading and trailing edges of sheet are both detected, examining the relationship of a position based on the number of passes in the horizontal direction is inherent to the invention); a print data forming unit (figure 9, reference 13); a printer driver that determines the position of a print-starting raster line and the number of printing passes (column 4, lines 28-37).



Saito et al differs from the claimed invention in that it does not disclose:

- {claim 1} preparing a raster-line/pin-relationship table; consulting the raster-line/pin-relationship table according to the determination; and printing the predetermined printing range by actuating the pins in each printing pass based on the raster-line/pin-relationship table.
- {claim 6} a raster-line/pin-relationship table; a printer driver that consults the raster-line/pin-relationship table, and outputs a pin driving signal for each driving pass according to the raster-line/pin-relationship table; a printing head

transferring unit that transfers the printing head to a predetermined position based on the signal from the printer driver; and a data transmitting unit that transmits print data and information required for printing operation received from the printer driver.

- {claims 2 and 7} a plurality of raster-line/pin-relationship tables.
- {claims 3 and 8} the position of the print-starting raster line being determined based on the print data under a condition of the vertical resolution of the print data, the pitch of the pins of the printing head, and the unit of vertical transfer of the printing head.
- {claims 4 and 9} any one of the pluralities of raster-line/pin-relationship tables being selected according to the position of the print-starting raster line which was determined.
- {claims 5 and 10} the pins used in each printing pass being actuated by consulting the selected raster-line/pin-relationship table.

Erickson (US Pat 5592202) discloses:

- {claims 1-10} a raster-line/pin-relationship table (figure 8A-C; column 11, lines 46-67). Erickson teaches that the disclosed tables represent schematic representations of pixel row printing using a simplified print head (column 11, lines 47-49). In other words, Erickson teaches that the raster-line/pin-relationship tables form a basis for which the relationship between raster lines and pins can be determined.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the raster-line/pin-relationship table disclosed by Erickson into the invention of Saito et al so that pins to be actuated for printing the raster lines to be printed are determined in each printing pass based on the relationship between the position of the pins and the raster lines. The motivation for the skilled artisan in doing so is to gain the benefit of forming a basis for which the relationship between raster lines and pins can be determined. With respect to claim 1, the combination naturally suggests consulting the raster-line/pin-relationship table according to the determination and printing the predetermined printing range

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by actuating the pins in each printing pass based on the raster-line/pin-relationship table. With respect to claim 6, the combination naturally suggests a printer driver that consults the raster-line/pin-relationship table, and outputs a pin driving signal for each driving pass according to the raster-line/pin-relationship table; a printing head transferring unit that transfers the printing head to a predetermined position based on the signal from the printer driver; and a data transmitting unit that transmits print data and information required for printing operation received from the printer driver. With respect to claims 3 and 8, the combination naturally suggests that the position of the print-starting raster line is determined based on the print data under a condition of the vertical resolution of the print data, the pitch of the pins of the printing head, and the unit of vertical transfer of the printing head (since the raster-line/pin-relationship tables disclose the relationship between the pins and raster lines and Saito et al teaches that this relationship is based on the vertical resolution of the print data, the pitch of the pins of the printing head, and the unit of vertical transfer of the printing head {as taught in claim 1 above}). With respect to claims 4 and 9, the combination naturally suggests that any one of the raster-line/pin-relationship tables is selected according to the position of the print-starting raster line, which was determined. With respect to claims 5 and 10, the combination naturally suggests that the pins used in each printing pass are actuated by consulting the selected raster-line/pin-relationship table (since Saito et al teaches printing by actuating the pins in each printing pass based on the raster-line/pin-relationship table {as taught in claim 1 above}).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Iwamoto et al (US Pat 5171093) discloses a control system for a dot matrix printer.

Kakutani et al (US Pat 6356358) discloses a dot recording method and dot recording device.

Otsuki (US Pat 6267467) discloses color printing using a vertical nozzle array head.

Otsuki (US Pat 6357856) discloses printing with a vertical nozzle array head

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Holstun (US Pat 7257690) discloses an ink ejection element firing order to minimize horizontal banding and the jaggedness of vertical lines.

Ogawa et al (US Pat 4941761) discloses a printing device capable of low-density printing and high-density printing.

Hickman (US Pat 6336701) discloses ink-jet print pass microstepping

Takagi et al (US Pat 6217149) discloses an ink jet printer.

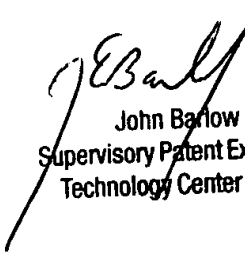
Yonekubo et al (US Pat 6328400) discloses a printer system, method of generating image, and recording medium for realizing the method.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leonard S Liang whose telephone number is (703) 305-4754. The examiner can normally be reached on 8:30-5 Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on (703) 308-3126. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7724 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

lsl LSL
September 5, 2002


John Barlow
Supervisory Patent Examiner
Technology Center 2800